



**Company:** Noble Energy

**Rig:** Production / Coretech

**API #** 05-123-24076

**Date:** 12/19/13

**Surveyor:** Brian Brewbaker

**VS:** 0.000

**Lat :** 40.52088

**Long:** -104.623

**Well:** Irvine 2-11

**Location:** Weld County, Colorado

**North Reference:** GRID

**Convergence:** Grid north is 0.57 degrees East of

**Declination:** 8.46

**Depth Reference:** Ground Level

**Elevation:** 4792

**Total Depth as Drilled:** 7300

**Lat & Long obtained by handheld GPS at wellhead**

**MS Gyro Survey Calculations**

Depth	Inc	AzG	N/-S	E/-W	TVD	DL	VS	CD	Cbrg
100.000	0.041	205.038	-0.032	-0.015	100.000	0.041	-0.032	0.035	205.038
200.000	0.243	9.575	0.145	0.005	200.000	0.282	0.145	0.145	2.110
300.000	0.305	281.556	0.407	-0.221	299.999	0.384	0.407	0.463	331.573
400.000	0.329	209.567	0.211	-0.624	399.998	0.374	0.211	0.658	288.675
500.000	0.317	191.831	-0.310	-0.822	499.996	0.100	-0.310	0.879	249.326
600.000	0.473	122.639	-0.804	-0.532	599.994	0.466	-0.804	0.964	213.478
700.000	0.231	339.407	-0.838	-0.255	699.993	0.672	-0.838	0.876	196.923
800.000	0.450	122.287	-0.859	0.006	799.992	0.649	-0.859	0.859	179.585
900.000	0.350	132.988	-1.277	0.562	899.990	0.124	-1.277	1.395	156.259
1000.000	0.294	290.932	-1.394	0.546	999.989	0.633	-1.394	1.497	158.623
1100.000	0.400	36.374	-1.022	0.513	1099.988	0.556	-1.022	1.143	153.345
1200.000	0.088	132.328	-0.792	0.776	1199.988	0.418	-0.792	1.109	135.586
1300.000	0.071	233.830	-0.880	0.782	1299.987	0.123	-0.880	1.178	138.367
1400.000	0.083	217.840	-0.974	0.688	1399.987	0.024	-0.974	1.192	144.761
1500.000	0.131	342.053	-0.922	0.609	1499.987	0.190	-0.922	1.105	146.585
1600.000	0.139	263.928	-0.827	0.453	1599.987	0.170	-0.827	0.943	151.279
1700.000	0.142	251.339	-0.879	0.215	1699.987	0.031	-0.879	0.905	166.258
1800.000	0.170	252.860	-0.963	-0.044	1799.986	0.028	-0.963	0.964	182.643
1900.000	0.160	319.027	-0.901	-0.278	1899.986	0.180	-0.901	0.943	197.126
2000.000	0.208	307.841	-0.685	-0.512	1999.986	0.060	-0.685	0.855	216.793
2100.000	0.055	330.036	-0.532	-0.679	2099.985	0.158	-0.532	0.863	231.927
2200.000	0.331	14.307	-0.211	-0.632	2199.985	0.294	-0.211	0.666	251.533
2300.000	0.377	51.343	0.274	-0.304	2299.983	0.229	0.274	0.409	312.038
2400.000	0.250	16.045	0.689	0.013	2399.981	0.225	0.689	0.689	1.095
2500.000	0.725	33.977	1.422	0.427	2499.978	0.493	1.422	1.485	16.703
2600.000	0.642	47.251	2.327	1.192	2599.970	0.178	2.327	2.615	27.116
2700.000	0.467	50.050	2.970	1.916	2699.966	0.177	2.970	3.534	32.830
2800.000	0.399	42.021	3.490	2.462	2799.963	0.091	3.490	4.271	35.197
2900.000	0.671	53.871	4.094	3.168	2899.958	0.291	4.094	5.177	37.729
3000.000	0.654	57.279	4.748	4.120	2999.952	0.043	4.748	6.286	40.954
3100.000	0.352	23.618	5.337	4.723	3099.948	0.410	5.337	7.127	41.507
3200.000	0.388	48.714	5.842	5.101	3199.946	0.164	5.842	7.755	41.124
3300.000	0.421	32.767	6.374	5.554	3299.944	0.117	6.374	8.454	41.064
3400.000	0.487	53.932	6.934	6.096	3399.940	0.179	6.934	9.233	41.322
3500.000	0.295	30.987	7.405	6.572	3499.938	0.244	7.405	9.900	41.591
3600.000	0.105	247.616	7.590	6.620	3599.938	0.384	7.590	10.072	41.094

3700.000	0.231	249.608	7.485	6.347	3699.937	0.126	7.485	9.814	40.295
3800.000	0.230	209.784	7.241	6.059	3799.937	0.157	7.241	9.441	39.918
3900.000	0.382	168.802	6.740	6.024	3899.935	0.258	6.740	9.039	41.789
4000.000	0.283	182.652	6.166	6.077	3999.934	0.127	6.166	8.657	44.585
4100.000	0.400	222.175	5.661	5.831	4099.932	0.256	5.661	8.127	45.851
4200.000	0.576	210.258	4.968	5.344	4199.928	0.202	4.968	7.297	47.087
4300.000	0.459	193.502	4.145	4.997	4299.924	0.190	4.145	6.492	50.328
4400.000	0.697	210.469	3.231	4.595	4399.919	0.291	3.231	5.617	54.890
4500.000	0.590	196.297	2.212	4.142	4499.913	0.191	2.212	4.696	61.893
4600.000	0.759	224.226	1.244	3.536	4599.906	0.364	1.244	3.749	70.617
4700.000	0.536	247.602	0.591	2.641	4699.900	0.341	0.591	2.707	77.384
4800.000	0.510	233.669	0.149	1.850	4799.896	0.130	0.149	1.856	85.386
4900.000	0.683	210.201	-0.630	1.192	4899.890	0.296	-0.630	1.348	117.844
5000.000	0.582	229.394	-1.476	0.506	4999.884	0.233	-1.476	1.560	161.074
5100.000	0.884	236.739	-2.230	-0.525	5099.876	0.315	-2.230	2.291	193.245
5200.000	0.759	214.224	-3.201	-1.542	5199.866	0.343	-3.201	3.553	205.730
5300.000	0.304	342.843	-3.495	-1.993	5299.863	0.978	-3.495	4.023	209.697
5400.000	0.333	343.936	-2.962	-2.152	5399.862	0.030	-2.962	3.661	215.999
5500.000	0.395	29.350	-2.382	-2.064	5499.860	0.287	-2.382	3.152	220.902
5600.000	0.835	22.849	-1.410	-1.612	5599.854	0.445	-1.410	2.142	228.814
5700.000	1.568	12.014	0.600	-1.044	5699.832	0.765	0.600	1.204	299.883
5800.000	1.643	356.012	3.369	-0.859	5799.793	0.453	3.369	3.476	345.700
5900.000	2.007	16.311	6.480	-0.467	5899.743	0.736	6.480	6.496	355.882
6000.000	2.610	26.873	10.191	1.054	5999.662	0.735	10.191	10.246	5.907
6100.000	2.484	32.324	14.053	3.242	6099.563	0.273	14.053	14.422	12.991
6200.000	2.551	30.091	17.809	5.516	6199.467	0.119	17.809	18.644	17.210
6300.000	2.663	22.652	21.879	7.527	6299.363	0.356	21.879	23.137	18.984
6400.000	2.908	21.308	26.386	9.343	6399.245	0.253	26.386	27.991	19.499
6500.000	2.754	20.930	30.992	11.123	6499.123	0.155	30.992	32.928	19.743
6600.000	2.595	27.722	35.240	13.034	6599.014	0.354	35.240	37.574	20.298
6700.000	2.153	35.747	38.769	15.185	6698.929	0.553	38.769	41.637	21.389
6800.000	2.152	41.649	41.696	17.530	6798.858	0.222	41.696	45.231	22.803
6900.000	2.157	44.816	44.434	20.104	6898.788	0.119	44.434	48.770	24.344
7000.000	2.204	52.959	46.927	22.965	6998.715	0.313	46.927	52.245	26.076
7050.000	2.305	51.039	48.138	24.514	7048.677	0.252	48.138	54.020	26.987

True North